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FIRST PERSON

First person – Xiaolei Gao

First Person is a series of interviews with the first authors of a selection of papers published in Journal of Cell Science, helping early-career researchers promote themselves alongside their papers. Xiaolei Gao is first author on 'The spindle pole body of *Aspergillus nidulans* is asymmetrical and contains changing numbers of γ-tubulin complexes', published in JCS. Xiaolei is a post-doc in the lab of Reinhard Fischer at the Institute for Applied Biosciences, Karlsruhe, Germany, where she focuses on elucidation of the organization of MTOCs at a molecular level.

Xiaolei Gao

How would you explain the main findings of your paper in lay terms?

Filamentous fungi are famous for their typical polar growth of the hyphae in nature. Cell wall extension at polar tips requires continuous transportation of secretion vesicles to the tip. The delivery process requires the cell cytoskeleton, namely, microtubules and actin filaments, together with motor proteins. My work focuses on the origin sites of microtubules (MTs), the so-called microtubule-organizing centres (MTOCs). In the filamentous fungi *Aspergillus nidulans*, there are two types of MTOCs: the spindle pole body (SPB), located at the nuclei and septa-located MTOCs (sMTOC), at the septum. The central component of MTOCs is a γ-tubulin ring complex (γ-TuRC). In budding yeast, this complex is smaller and called the γ-tubulin small complex (γ-TuSC). Our research characterized a new component of the γ-TuRC, MztA, and found that it played a different role in different layers of the MTOCs. MztA sits only at the outer side of SPB but not on the inner side. MztA helps γ-TuSC to assemble into a large γ-TuRC. Thus, in our model, the SPB is asymmetric, with the small γ-TuSC at the outer side and the large γ-TuRC at the inner side. Our finding adds new information about the structure of SPBs and sMTOCs in a model system of polar growth.

Were there any specific challenges associated with this project? If so, how did you overcome them?

Yes. Research on MTOCs in *A. nidulans* is far behind that of budding yeast and human cells, although some core aspects are the same. The first paper of this project took several years and the review process suffered several rounds of rejections. I was involved in the revision and learned a lot about how to address the questions of reviewers. It was a steep learning process about scientific thinking and writing. Later, MztA protein was found to be interesting, but initially the length of this protein was defined incorrectly. I checked the RNA sequencing data and experimentally confirmed the correct open reading frame.

Why did you choose Journal of Cell Science for your paper?

Because this journal is famous in the field of cell biology and its high level of representing scientific data. I have taken part in one of the journal conferences and I was impressed by its perfect organization. The journal publication system is also very user friendly and time saving.

What motivated you to pursue a career in science, and what have been the most interesting moments on the path that led you to where you are now?

The beginning of my PhD phase was full of challenges because my background wasn't a good match and I lacked some of the required knowledge. Fortunately, my supervisor is very nice and encouraged me a lot. He gave me a lot of freedom and time to experiment even without positive results. The beauty of science fades when you are struggling with your experiments for an extended period. It is hard work but it helps a lot to work on self-improvement and to discover yourself. I think this is why I choose to pursue a career in science. In addition, I am keen on educating the next generation going into science. The most exciting moment on this path for me is when I find a solution after trying many times.

Who are your role models in science? Why?

Female scientists who have made fabulous contributions to science and have a happy family too.

What's next for you?

Further studies of MTOCs in other organisms (e.g. *Neurospora crassa*) or mammalian cells would help to improve our understanding of their role at the molecular level. At the moment,

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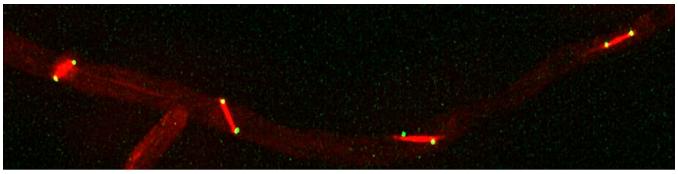

A microscopy photo of mCherry, labelling microtubules, and GFP, labelling SPBs, during mitosis in an *Aspergillus nidulans* hyphae.

I am interested in the regulatory part of MTOC activity, because microtubule organization is strictly related to cell cycle progression. Many diseases are related to the mis-regulation of microtubule-controlled processes, which add another applicable level to the research. The study of MTOCs could help to develop anti-cancer reagents.

For my personal career, I would like to work in a field that encompasses applied sciences and theoretical research. I hope to contribute helping to solve common problems of human health. Personally, one of the most important aspects of my career would also be teaching research techniques to the next generation and guiding them toward a scientific way of working.

Tell us something interesting about yourself that wouldn't be on your CV

I am a person whose mood is strictly and naturally regulated by the weather and air pressure.

Reference

Gao, X., Schmid, M., Zhang, Y., Fukuda, S., Takeshita, N. and Fischer, R. (2019). The spindle pole body of *Aspergillus nidulans* is asymmetrical and contains changing numbers of γ-tubulin complexes. *J. Cell Sci.* **132**, 234799. doi:10.1242/jcs.234799